Office of the
Director of Medical Services,
Health Department,
Zanzibar,

31st May, 1953

Sir,

I have the honour to submit for the information of His Excellency the British Resident and for transmission to the Right Honourable the Secretary of State, the Medical Report on the Health and Sanitation conditions of the Zanzibar Protectorate for the year 1952.

I have the honour to be,

Sir,

Your obedient servant,

A. C. HOWARD,
Director of Medical Services,
Health Department

The Honourable
The Chief Secretary to the Government,
Zanzibar.

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ZANZIBAR PROTECTORATE

Medical and Sanitary Report

for the year ended

31st December, 1952

SECTION I.—ADMINISTRATION: GENERAL REVIEW

STAFF

The Establishment of Senior Medical Staff for 1952 as sanctioned in the estimates was as follows:—

One Senior Medical Officer-in-Charge, Medical and Sanitary Services.
One Specialist Officer (Surgeon).
One Pathologist.
Six Medical Officers (including Medical Officer of Health).
Three Sub-Assistant Surgeons.
Five Assistant Medical Officers.
Two Dental Surgeons.
One Matron.
One Sister-Tutor
Nine Nursing Sisters.
One Male Mental Nurse (Superintendent, Mental Hospital).
One Sanitary Superintendent.

2. Dr. A. C. Howard arrived in January and assumed duty as Senior Medical Officer-in-Charge, Medical and Sanitary Services. This title was later changed to that of Director of Medical Services.

3. Dr. F. Jaworsky proceeded on leave in June prior to the expiry of his contract. Dr. G. T. Balean returned from leave and Dr. K. D. Young proceeded on leave in September, in order to take the long course for the Diploma of Tuberculosis Disease at Cardiff beginning in October, having been awarded a World Health Organisation Fellowship for this purpose.

4. The following Nursing Sisters arrived on first appointment: Miss B. M. Coveney and Miss P. E. Allen in May and Miss K. P. Rochford, Miss J. M. Saw and Miss A. M. C. Duncan in July, the approved establishment having been increased to ten Sisters.

Mr. E. H. Lavers, Sanitary Superintendent, returned from leave in February. Miss I. Hebden left the service while on leave and Miss I. Smails resigned on marriage in October.

Dr. Dina Nath Koura, Senior Sub-Assistant Surgeon, retired on pension in September.

5. The sudden death of Mr. U. S. Dave, who had been Head Clerk of the department for the last six years and who had worked in the Medical Department for not less than twenty-four years, was a great loss which will be felt for some time to come. The vacancy was filled by the promotion of Mr. R. G. Dubey from the post of Cashier.

TRAINING OF STAFF

6. No systematic training of Sanitary Inspectors took place during the year and the staff is now 33 per cent below the approved establishment. Preliminary arrangements were made for the training of inspectors at the Tanganyika training school in Kongwa during 1953.

7. The training of hospital attendants, nurses and midwives continued through the activities of the Sister-Tutor provided in the Development Programme. During the year 1952, six male nurses and one female nurse passed the final examination and in addition six midwives passed the midwifery examination of whom four are trained nurses.

DISTINGUISHED VISITORS

8. The following made very welcome visits to the Protectorate during the year:—

Dr. Douglas Guthrie, M.D., F.R.C.S.

Dr. R. G. Cochrane, M.D., F.R.C.P., D.P.H., Medical Secretary of the British Empire Leprosy Relief Association.

Dr. T. A. Austin, C.M.G., M.B. (World Health Organisation).

Mr. E. F. King, F.R.C.S., Ophthalmic Surgeon to Westminster Hospital.

Sir Eric Pridie, K.C.M.G., D.S.O., O.B.E., M.B., Chief Medical Officer, Colonial Office.

Dr. Alan Mozley, F.R.S. (E.).

Dr. C. C. Chesterman, O.B.E., M.D., M.R.C.P., Member of Colonial Advisory Medical Committee.

Dr. Bagster Wilson, M.D., D.T.M. & H., Director of Amani Malaria Unit.

HOSPITALS

A.—Buildings

9. The construction of the new hospital continued throughout the year. Some modifications of the original plans were found necessary.

10. A new male ward, and a mortuary and store were constructed at Dole T.B. Sanatorium, as a result of a generous donation from Mr. Tayabali Karimjee. The hospital has now been re-named the Zenubbai Karimjee Hospital in memory of his late wife.

B.—General

11. The work of the hospitals was fully maintained during the year, the number of in-patients being 6,160 compared with 6,289 in 1951.

DISPENSARIES

12. The work of the Rural Dispensaries continued throughout the year.

These dispensaries are sited to serve the major centres of population in the two islands as follows:—

Zanzibar

1. Kizimbani.
2. Makunduchi.
3. Kizimkazi.
4. Chwaka.
5. Bweleo.
6. Mwera.
7. Mkokotoni.
8. Selem.
9. Jambiani.

Pemba

1. Mzambaraoni.
2. Kinazini.
3. Konde.
4. Kengeja.
5. Fufuni.
6. Ole.
7. Ziwani.

The number of patients treated in dispensaries was—

New cases	55,241
Re-attendances	105,532

MATERNITY AND CHILD WELFARE

13. These services were maintained. There were 854 confinements in Government hospitals compared with 653 in 1951 (shown in Tables on pages 22, 23 and 24). The Makunduchi Rural Health Unit is proving successful and popular. It is staffed by two midwives and visited weekly by a Nursing Sister. During the year 1952, 133 women were confined.

SCHOOL MEDICAL AND DENTAL SERVICES

14. The Assistant Medical Officer in charge of the school medical service continued to carry out school inspections during the year.

The number of pupils is increasing annually.

The total number inspected was 1,114. At the end of each inspection day the cards were handed over to the headmasters so that the pupils could receive any necessary attention as soon as possible. All students who required medical and surgical treatment were referred to the hospital.

One thousand, four hundred and seventy-two students of the district and town schools were vaccinated and their vaccinations inspected.

In Pemba 387 pupils were examined. Shortage of Medical staff prevented medical examinations being made at all schools, but the rural schools were concentrated upon.

The school dental service was continued throughout the year both in Zanzibar and Pemba.

SECTION II.—PUBLIC HEALTH

1. RETURNS

15. The total number of patients seen at hospitals and dispensaries during the last five years was as follows:—

	1948	1949	1950	1951	1952
New cases	138,939	127,816	133,216	130,522	143,090
In-patients	6,819	6,228	6,011	6,533	6,160
Total Attendances ...	525,473	454,236	304,687	305,597	332,075
Deaths in Hospital ...	482	376	318	357	370

The principal causes of deaths were—

Respiratory Tuberculosis	31
Malaria	24
Iron dificiency anaemias	22
Diseases of Heart	24
Lobar Pneumonia	23
Broncho-Pneumonia	14
Intestinal obstruction and hernia	29
Senility	17
Neoplasma	15
Diseases of Newborn and early infancy	22

2. COMMUNICABLE DISEASES

A.—Insect-borne

16. *Malaria.*—8,647 cases were notified during the year and of these 499 were treated as in-patients. There were twenty-four deaths. The figures for 1951 were 10,031 cases including 704 in-patients and fourteen deaths.

17. *Blackwater.*—There were two cases during 1952 with one death.

18. *Plague.*—There has been no case of this disease for many years, but the Health Department continues the systematic trapping of rats in order to ascertain whether plague is present among the rat population. Daily tests made by the Laboratory proved negative for plague bacilli.

During the year 6,104 rats were trapped giving an average of ·1 rat per house trapped. Traps were set on 177,077 occasions giving a result of 3·44 rats trapped per 100 traps.

19. *Relapsing Fever.*—There were no cases during the year.

20. *Yellow Fever.*—No case of Yellow Fever was detected during the year. The *Aedes* index in urban areas remains very low.

During the year a survey of the blood sera of school children was carried out in Zanzibar and Pemba with the aid of the Virus Research Institute, Entebbe. The blood of approximately 125 children and young adults who had never travelled outside the Protectorate or been immunised against yellow fever was examined for anti-bodies by the mouse protection test. The percentage of positives was found to be 2·4. This result suggested that Zanzibar and Pemba should be included in the endemic area.

B.—Infectious Diseases

21. The following table is a comparison of the infectious diseases notified for the past six years.

	1947	1948	1949	1950	1951	1952
Chicken pox	195	44	421	131	53	90
Diphtheria	5	7	4	–	1	2
Dysentery Amoebic ...	83	69	83	89	49	38
Dysentery Bacillary ...	15	38	14	34	79	10
Erysipelas	–	1	1	–	1	1
German Measles	7	9	–	1	–	–
Leprosy	7	20	20	12	22	17
Measles	77	52	37	6	112	61
Mumps	2	4	40	34	49	535
Puerperal Fever	1	1	–	14	8	5
Relapsing Fever	3	1	2	1	–	–
Tetanus	–	2	2	–	–	–
Tuberculosis	120	125	168	135	125	106
Typhoid Fever	9	13	12	11	10	5
Typhus Fever	–	1	–	–	–	–
Whooping Cough	46	24	59	45	16	51
Poliomyelitis	–	–	–	1	–	1
Small-pox	–	–	–	–	–	1*

*One imported case from India.

22. *Smallpox.*—There were no cases reported in the Protectorate although the disease occurred in the neighbouring mainland territories.

A case of smallpox in an Indian child was admitted to the Infectious Diseases Hospital, Gulioni, ex s.s. *Amra* on 5th May, 1952. The case had been diagnosed at Mombasa, but had been authorised to remain in the ship's isolation hospital when she left Mombasa. All final destination passengers disembarking at Zanzibar were kept under surveillance for fourteen days. The child made an uninterrupted recovery and no further cases developed.

Vaccinations were carried out at the Health Office. There were numerous passengers arriving by dhow and other boats from the adjacent territories who were not in possession of valid certificates and in all such cases vaccination was insisted upon.

Passengers arriving on ships and planes have their health documents inspected, and those without valid vaccination certificates are vaccinated.

The following vaccinations were performed during the year:—

Zanzibar township	24,160
Pemba Island	2,754
Total ...	26,914

23. *Tuberculosis.*—Tuberculosis continues to be one of the greatest public health problems in the Protectorate. During the year the tuberculin testing survey was completed in Pemba and Zanzibar and the report will be found in Appendix II to this report.

The opening of a new ward at Dole Sanatorium (Zenubbai Karimjee Hospital) increased the available accommodation there to 40 beds, for male patients only. Female patients still have to be accommodated in the General Hospital, but it is hoped to build a female ward at Dole in due course.

The policy has been to admit only those patients who have a reasonable chance of recovery and in whom the disease is not too far advanced. Other advanced cases are admitted to the tuberculosis section of the Walezo institution.

During the year forty-one patients were admitted for treatment and seventeen patients were discharged. Details of the treatment given will be found in Appendix II.

In all 455 cases attended Government Hospitals. Admissions numbered 171 and there were thirty-one deaths.

There were 106 new cases of tuberculosis notified in Zanzibar and forty-five cases in Pemba. Out of Zanzibar cases seventy-eight were from the Zanzibar township, twenty-eight from the rural districts.

The isolation of open cases in hospital is a great advance, but bed-space is limited and only a small proportion of cases can be so isolated.

District Sanitary Inspectors in Zanzibar township regularly visited all cases in their areas at monthly intervals to ascertain conditions of patients, change of domicile and to ensure that preventive measures were being carried out. Disinfectant was issued for the treatment of infected sputum.

Family contacts of the patient were medically examined for the detection of early infections and the local Welfare Society was informed of all cases to enable their staff to render any assistance found necessary on investigation.

24. *Leprosy.*—The leper settlement at Walezo (Zanzibar) and Makondeni (Pemba) were maintained as in previous years. The numbers of patients treated at the two settlements were as follows:—

	Walezo		*Makondeni*
Remaining on 31st December, 1951 ...	**55**	**...**	**51**
Admitted during 1952	**18**	**...**	**20**
Discharged	**8**	**...**	**2**
Died	**5**	**...**	**–**
Remaining on 31st December, 1952 ...	**60**	**...**	**71**

Walezo

25. The management of the Walezo leper settlement remains under the care of the Roman Catholic Mission. There are now forty-three huts for patients at Walezo. Those patients who are capable of working are employed by the Mission and paid a salary.

During the year the following works were effected at Walezo institution:—

(*a*) One building for servants was constructed.

(*b*) The third stone-house for lepers was erected. Each house consists of two rooms and each room is arranged to be occupied by either a married couple or shared by two unmarried lepers of the same sex.

Considerable improvement has resulted since the introduction of the new sulphone treatment into Walezo leprosarium. In lepromatous cases successful reduction of the size of œdœmatous skin and nodules has been observed. In tuberculoid cases the reduction of raised edges of patches was reported last year, but during this year further improvement has been observed that in some cases the skin seemed to be on its way towards regaining its normal colour.

Dr. Cochrane during his recent visit to Walezo pointed out that the patches in many cases do not disappear entirely after the disease has been cured.

The hæmoglobin is tested in all patients regularly while they are undergoing treatment and D.D.S. is withheld if the percentage of hæmoglobin falls below 60 per cent. To combat anæmia cytamen (Vitamin B-12) injections, yeast and iron are given and good response to this treatment has been obtained.

Lepra reaction has been limited to very few patients during this year and all these seem by now to have acquired tolerance of the drug in specified doses, the majority of them take three tablets (300 mg.) of diaminodiphenyl sulphone daily for twenty-one days followed by one week's rest without any reaction.

Makondeni (Pemba)

26. Local staff and accommodation remain unchanged from 1951; there is accommodation for ninety-two lepers and at present there are sixty-nine lepers in residence.

Prior to April, 1952, the colony was supervised by the Sanitary Inspector, Wete, under the District Medical Officer. One hospital orderly is in actual charge and lives on the spot.

In April, 1952, a British Empire Leper Relief Association lay-worker arrived in Pemba to take over the anti-leprosy work in the island. From then until the end of the year, the daily supervision of the colony was under his control and much has been done towards improving and enlarging the settlement. A grant of about six acres of land has been made with a view to extending the colony in 1953. The B.E.L.R.A. lay-worker has been surveying the island searching for new cases with a view to getting them to come into the colony when room has been made for them. So far about sixty unrecorded cases have been detected.

Some of the inmates are employed on work in the colony, being paid from public funds. They are as follows:—

Dispenser ...	1	Wood chopper ...	1
Cook (female) ...	1	Dhobi	1
Water-carrier ...	1	Herdsman ...	1
Grass cutter ...	1	Bullock-cart driver	1
Road repairer ...	1		

The job of herdsman which in 1951 was held by a non-leper has now been given to a patient.

About 75 per cent of the lepers are on sulphone treatment. There have been very few cases of lepra reaction and the patients' hæmoglobin which is assessed at monthly intervals remains at a satisfactory level. They have mostly been on treatment for about eighteen months.

The District Medical Officer, Pemba, visits the colony at least once a week. All patients are seen in rotation as a routine and any cases requiring extra attention are examined whenever necessary.

VITAL STATISTICS

27. The Medical Officer of Health has continued to act as Registrar of Births and Deaths for Zanzibar Town and the recipient of quarterly vital statistics from rural areas. The system of collection of these figures is primitive and the results correspondingly unreliable.

Estimated population of Zanzibar and Pemba for 1951		272,976
Add births	5,615	
Add Immigrants	35,460	41,075
Total		314,051
Deduct deaths	3,437	
,, Emigrants	39,830	43,267
Total estimated population for 1952		270,784

28. *Births and deaths.*—A total of 3,452 births and 2,032 deaths were recorded in Zanzibar and 2,163 births and 1,405 deaths registered in Pemba.

Birth rate 20.7 per thousand, death rate 12.7 per thousand.

29. *Infantile mortality.*—212 deaths of children under one year were registered. The infantile mortality rate was 37.7 per thousand live births.

30. *Still-births.*—Forty-seven still-births were registered. The still-birth rate was 8.3 per thousand births.

31. *Maternal mortality.*—Seven maternal deaths were registered. The mortality rate was 1.2 per thousand.

SECTION III.—HYGIENE AND SANITATION

MOSQUITO CONTROL

32. *Zanzibar town.*—The following measures have been carried out to reduce the prevalence of mosquitoes generally.

(*a*) Routine anti-malarial control by clearing of plots and open lands, oiling, filling, draining, etc., was carried out over the town area every day.

(*b*) Over 11,000 houses and huts in the town were inspected once a week in order to eliminate the breeding places of mosquitoes. Details of these inspections, results, and action taken, are entered on daily report forms by the Sanitary Orderlies employed. To discourage slackness and maintain high standards of inspection, check inspectors visit all areas. (Details are given in Table A.)

(*c*) Careful watch is kept to prevent cattle being grazed within the township as it has been found that their hoof-prints are responsible for about 66 per cent of the anopheline breeding places found in the town. In spite of it being an offence under the Public Health Decree many cattle-owners do bring their cattle into the town especially into swampy areas. Although thirteen owners involving 104 cattle were prosecuted, the small fines awarded by the court failed to act as a sufficient deterrent.

(*d*) Formerly water connections were made to premises without due regard to drainage facilities, with the result that many mosquito breeding places were found. Now all new water connections are referred to the Health Department for recommendation before the connections are made. During the year 207 new water connections were dealt with.

(*e*) In order to ascertain the effectiveness of methods used to destroy the mosquito in the larval stage special control stations in the township were visited daily for adult mosquito catching (the results are shown in Table B). Also different control stations were selected in all the sanitary districts of the town, and weekly visits were made for all adult mosquito catching. (The results are shown in Table C.) In addition, regular inspections and collections of adult mosquitoes were made in the cells of the Zanzibar Prison. (The results are shown in Table D.)

(*f*) A protective belt extending to a depth of one mile outside the Zanzibar township boundaries, and running from north to south, was regularly kept under control in order to reduce the number of adult mosquitoes entering the town. (The results are shown in Table E.) Houses situated in a portion of this belt nearest to the town boundaries were sprayed with D.D.T. as a preventive measure (*see* results given in Table F).

It will be seen that the control of the culicine mosquitoes is the most difficult problem. Although efforts are made to reduce the breeding in the numerous pit-latrines in town by oiling, the problem will remain until gradually the conversion of pit-latrines to the water-flushed system eliminates the breeding places.

(*h*) *Airport.*—The area surrounding the airport at Kisauni was regularly inspected, and control measures maintained.

(*i*) *Rural Areas.*—In accordance with suggestions made by the Director of the East African Malaria Unit adult mosquito catches were made in three rural districts in Zanzibar throughout the year, as a guide to possible future development. (Results are given in Table G).

TABLE A

Inspection of Premises

	Zanzibar township	*Protective belt outside township*
Europeans	6,196	500
Indians	126,256	310
Arabs	77,178	768
Africans	258,944	16,721
Others	46,478	—
Vacant houses	14,344	1,089
Mosques and temples	6,955	643
	536,351	20,031

Other Inspections

	Zanzibar township	*Protective belt outside township*
Sullage and cesspits	170,825	9,006
Drains	25,235	1,539
Gully traps	69,345	2,293
Roof gutterings	1,207	382
Borrow pits	396	2,277
Swamps	48	450
Crab holes	123,276	1,250
Anti-malarial drains	1,876	654
Dhows on beach	170	1,403
Boats	1,544	1,076
Wells and water holes	1,528	3,175
Pools	767	1,196
Gardens	13,153	501
Graveyards	7,274	476
Open lands	17,416	5,244
Trees	7,744	56,606
Mosquito traps	42	—
	441,846	87,528

TABLE B

Adult Mosquitoes caught on daily visits in special control stations in Zanzibar township—1952

Month	*"A" Sanitary District*			*"E" Sanitary District*			*Total*		
	Anoph.	*Culex.*	*Aedes.*	*Anoph.*	*Culex.*	*Aedes.*	*Anoph.*	*Culex.*	*Aedes*
January	—	171	—	—	284	—	—	455	—
February	—	109	—	—	262	—	—	371	—
March	—	139	—	—	219	—	—	358	—
April	—	114	—	—	220	—	—	334	—
May	—	129	—	—	221	—	—	350	—
June	—	117	—	—	122	—	—	239	—
July	—	136	1	—	195	—	—	331	1
August	—	44	—	—	63	—	—	107	—
September	—	185	—	—	122	—	—	307	—
October	—	77	—	—	109	—	—	186	—
November	—	119	—	—	48	—	—	167	—
December	—	143	—	—	165	—	—	308	—
	—	1,483	1	—	2,030	—	—	3,513	1

TABLE C

Adult Mosquitoes caught on weekly visits in control stations in Zanzibar township—1952

Month	"A" *Sanitary District*			"B" *Sanitary District*			"C" *Sanitary District*			"D" *Sanitary District*			"E" *Sanitary District*			"F" *Sanitary District*		
	A	C	Ae.	A	C	Ae.	A	C	Ae.	A	C	Ae.	A	C	Ae.	A	C	Ae.
January	–	2	–	–	1	–	–	2	–	–	10	–	–	–	–	–	31	–
February	–	–	–	–	–	–	–	11	–	–	2	–	–	–	–	–	22	–
March	–	–	–	–	3	–	–	5	–	–	–	–	–	–	–	–	24	–
April	–	2	–	–	1	–	–	10	–	–	3	–	–	–	–	–	24	–
May	–	–	–	–	5	–	–	9	–	–	11	–	–	–	–	–	9	–
June	–	–	–	–	–	–	–	17	–	–	3	–	–	–	–	–	11	–
July	–	–	–	–	–	–	–	5	–	–	6	–	–	–	–	–	28	–
August	–	–	–	–	–	–	–	6	–	–	–	–	–	–	–	–	4	–
September	–	23	–	–	–	–	–	15	–	–	–	–	–	–	–	–	–	–
October	–	–	–	–	1	–	–	1	–	–	–	–	–	–	–	–	3	–
November	–	–	–	–	–	–	–	6	–	–	–	–	–	–	–	–	2	–
December	–	–	–	–	–	–	–	6	–	–	–	–	–	–	–	–	4	–
	–	27	–	–	11	–	–	93	–	–	35	–	–	–	–	–	162	–

TABLE D

Zanzibar Prison's adult mosquito-catches during the year 1952

Month	*First Offender Block*			*Old Offender Block*			*Asiatic Block*			*Total*		
	A	C	Ae.	A	C	Ae.	A	C	Ae.	A	C	Ae.
January	–	96	–	2	80	–	–	90	–	2	266	–
February	–	77	–	1	59	–	1	68	–	2	204	–
March	–	63	–	–	47	–	–	63	–	–	173	–
April	–	73	–	–	39	–	–	61	–	–	173	–
May	–	70	–	1	43	–	–	75	–	1	188	–
June	–	70	–	–	52	–	–	50	–	–	181	–
July	–	64	–	1	47	–	–	58	–	1	169	–
August	–	56	–	1	32	–	–	48	–	1	136	–
September	–	64	–	–	46	–	–	64	–	–	174	–
October	–	48	–	–	50	–	–	53	–	–	151	–
November	–	73	–	–	83	–	–	57	–	–	213	–
December	2	85	–	2	80	–	–	73	–	4	238	–
	2	839	–	8	658	–	1	769	–	11	2,266	–

Zanzibar Prison's yearly totals of adult mosquito-catches from 1946 to 1952

Year	*Wet Days*	*Rainfall*	*Anopheles*	*Culex*	*Aedes*
1946	126 ...	52.55 ...	1,375 ...	1,467 ...	2
1947	139 ...	73.11 ...	80 ...	752 ...	–
1948	173 ...	75.01 ...	13 ...	524 ...	–
1949	111 ...	36.54 ...	12 ...	744 ...	–
1950	136 ...	57.61 ...	47 ...	1,078 ...	1
1951	158 ...	84.44 ...	174 ...	1,351 ...	–
1952	98 ...	29.60 ...	2 ...	839 ...	–

Table E

Breeding Places Found

	Zanzibar township	*Protective belt outside township*
Anopheles	3	50
Aedes	367	79
Culex	137	123

Adult Mosquitoes caught in control stations

	Zanzibar township	*Protective belt outside township*
Anopheles	0	2
Aedes	1	25
Culex	3,841	314
Premises inspected	532,377	33,104
Aedes findings on premises	367	79
Aedes Index (per cent)	0.07	0.2

Action taken

	Zanzibar township	*Protective belt outside township*
Notices for abatement served	409	11
Prosecutions for failure to abate	3	—
Earth drains or ditches cleaned and graded (linear feet)	582	38,168
New earth drains made	—	—
Lowlying land raised (sq. yards)	10,324	—
Number of oilings:		
Drains	2,791	99
Tanks	183	—
Cesspits	41,048	116
Sullage pits	6,370	44
Swamps and pools	125	104
Additional measures taken:		
Pools or excavations filled in	112	—
Holes in trees filled in	14	10
Crab holes oiled and filled in	991	310
Crab holes found containing larvae	142	—
Dead crabs found after being poisoned	1,426	—
Spraying of swamps, pools and rice fields with paris green	—	—
Eaves and gutters removed or re-aligned	10	—
Water tanks rendered mosquito proof	2	—
Bush and undergrowth cleared (sq. yards)	3,626,540	96,720
Shells, coconut husks, tins, etc., removed	14,844	55,968
Premises sprayed with D.D.T. solution	60	6

Table F

Protective Barrier

All houses in the half-mile protective belt outside the town boundary were sprayed with D.D.T. wettable powder during the year 1952. Immediately after spraying had been completed the following dead mosquitoes were collected from the white sheets spread on the floor:—

Month	*No. of Huts*	*Anopheles*	*Culex*	*Aedes*
January	192	15	127	48
April	185	1	45	10
July	185	3	30	9
October	195	6	44	8
	757	25	246	75

Check on Preventive Measures

During the year commencing from 3rd January, 1952, six control stations have been set up, three within and three outside the town. These were sprayed with pyrethrum solution once a week.

Immediately after spraying the following dead mosquitoes were collected from white sheets spread on the floors:—

Inside Town Boundary									*Outside Town Boundary*								
Mental Hospital			Hut No. 37/60			Hut No. 24/17			Hut No. 1 Mazizini			Hut No. 177 Makunduchi Road			Hut No. 380 Marahubi		
A	C	Ae	A	C	Ae	A	C	Ae	A	C	Ae	A	C	Ae	A	C	Ae
1	15	0	0	53	0	0	32	0	0	28	1	0	14	0	0	17	0
0	15	0	0	8	0	0	20	2	0	10	3	0	61	0	0	9	0
1	30	0	0	61	0	0	52	2	0	38	4	0	75	0	0	26	0

TABLE G

Adult Mosquito Survey in Rural Districts of Zanzibar Island

Three huts were selected in each village and three villages in each district and regularly inspected.

Chwaka Rural District

1952	*Chwaka*			*Ndijani*			*Uroa*		
	A.	C.	Ae.	A.	C.	Ae.	A.	C.	Ae.
April	—	—	—	—	4	—	—	3	—
May	—	14	—	—	12	—	—	12	—
June	—	5	—	—	4	—	—	—	—
July	—	15	—	—	24	—	—	11	—
August	—	18	—	—	13	—	—	—	—
September	—	17	—	3	8	—	—	1	—
October	—	6	—	—	3	—	—	—	—
November	—	9	—	—	6	—	—	1	—
December	Sanitary Inspector admitted hospital (no figures available).								
	—	24	—	3	74	—	—	28	—

Makunduchi Rural District

1952	*Kiongani*			*Kijini*			*Kumbini*		
	A.	C.	Ae.	A.	C.	Ae.	A.	C.	Ae.
January	—	12	—	—	10	—	—	9	—
February	—	11	—	—	8	—	—	4	—
March	—	2	3	—	2	1	—	3	2
April	3	3	6	1	5	4	4	6	5
May	1	2	3	—	2	2	1	6	4
June	—	4	1	—	6	—	—	2	—
July	—	4	1	—	3	—	—	1	1
August	2	6	3	2	11	3	3	11	7
September	2	9	3	3	13	3	4	10	1
October	5	21	3	—	18	—	—	11	3
November	—	4	—	—	6	—	—	6	—
December	—	4	1	—	6	1	1	1	1
	13	82	24	6	90	15	13	70	25

Mkokotoni Rural District

1952	*Mkokotoni*			*Mkwajuni*			*Kivunge*		
	A.	C.	Ac.	A.	C.	Ac.	A.	C.	Ac.
January	—	9	—	—	12	—	—	16	—
February	—	6	—	—	7	—	—	4	—
March	—	5	—	—	6	—	—	6	—
April	1	18	—	—	15	—	—	7	—
May	1	18	—	—	17	—	—	16	—
June	—	9	—	—	5	—	—	4	—
July	—	7	—	—	4	—	—	2	—
August	—	8	—	—	11	—	—	7	—
September	—	7	—	—	12	—	—	9	—
October	—	7	—	—	9	—	—	5	—
November	—	6	—	—	5	—	—	8	—
December	—	7	—	—	8	—	—	6	—
	2	107	—	—	111	—	—	90	—

LICENSED PREMISES

33. All licensed premises were inspected before the issue of new licences. The co-operation of the Municipal Officer has been of great assistance in the carrying out of this important work during the year.

Altogether ninety-three eating-houses, fifty-seven houses-let-in-lodgings, forty laundries, eleven bake-houses and twelve dairies were inspected. Notices were issued when the premises were found to be below the required legal standard.

FACTORIES

34. District Sanitary Inspectors continue to carry out their duties as Inspectors of Factories under the Factories (Supervision and Safety) Decree, 1943, and regularly visited the premises.

Notices were served for the remedying of defects affecting the health and safety of the persons employed.

GENERAL MEASURES OF SANITATION

(a) *Sewage Disposal and Drainage Improvements in Sanitation in Private Houses*

35. Gradual progress has continued in converting insanitary pit-latrines into water-flushed closets, although in many cases the owners have only complied after long litigation. Nightsoil is still disposed of in septic tanks and cesspits.

It is however expected that the work will soon start on the scheme to construct an adequate main drainage system in Zanzibar town.

The general policy of installing water-flushing closets in place of pit-latrines will proceed more rapidly when an adequate drainage system in Zanzibar town is available.

During the year forty-seven septic tanks were constructed by private owners, and 124 W.C. pans installed. 17,773 feet of four-inch glazed earthenware drain pipes were laid, and 1,248 feet of four-inch iron soil pipes and 500 feet of three-inch iron waste pipes were fixed.

This enabled thirty-seven cesspits, and forty-one sullage-pits to be abolished and filled in.

Public Drainage.—The following new drains were laid in Zanzibar during the year: One thousand, seven hundred and thirty feet four-inch sewer extension at the Civic Centre, the Mental Hospital and in the Mchangani area.

(*b*) *Scavenging and Refuse Disposal*

One hundred and ten thousand, two hundred and eighty-two cart-loads of refuse were removed during the year from the six sanitary districts of Zanzibar township as compared with 107,007 in 1951.

With the exception of the refuse burnt at the refuse-destructor, refuse was used for raising the level of low-lying areas by controlled dumping.

CONTROL OF FLIES

36. The locally made fly-traps are placed on fixed sites in all areas, and baited daily. A fly searcher also visits all districts in Zanzibar township to discover any breeding places which are immediately dealt with.

Number of fly-traps used—

Zanzibar Town	54
Zanzibar Rural Districts ...	29
Pemba	28

Number of fly breeding places detected—

Deposits of Refuse	13
Trapped Gully	2
Cowdung	5
Dead animals	5
Animal excreta	11
Dustbins	7
Offals	1
Drains	1
Dead birds	6
Human excreta	18
Dumps	6
Sea shells	1
Decomposed food	4

The meat and fish sections of the central market were sprayed with D.D.T. solution during the year, and resulted in a considerable reduction of flies.

HOUSING AND TOWN-PLANNING: ZANZIBAR TOWNSHIP

37. Inspections and recommendations were made in connection with the following applications made to the Joint Building Authority:—

Stone Buildings

Applications with plans:	1948	1949	1950	1951	1952
Erection of new buildings	15	23	26	14	28
Major alterations and additions including drainage to existing buildings	104	115	100	115	125
Applications without plans:					
Alterations and additions	132	256	257	260	261
Permits refused	8	4	5	12	8
Notices served for unauthorised works ...	9	23	14	12	22
Notices served for dangerous structures ...	102	190	116	111	124

Native-type Buildings

	1948	1949	1950	1951	1952
Erection of new huts	166	137	170	296	181
Reconstruction and extension of existing huts	584	245	227	281	345
Repairs to existing huts	634	1,306	1,420	1,680	1,245
Notices served for unauthorised works ...	23	34	54	61	69
Notices served for demolition	12	6	10	4	5

Ruinous or insanitary huts demolished

	1948	1949	1950	1951	1952
Stone Town	9	23	–	–	1
Ngambo	114	80	25	16	35

FOODSTUFFS IN RELATION TO HEALTH AND DISEASES

38. All licensed premises dealing with food, such as eating-houses, bake-houses, milk shops, and markets were regularly inspected, and the necessary improvements effected where found necessary. Seventy-nine notices were served in connection with these improvements.

Licensed hawkers of food were kept under strict observation, and all their utensils had to be approved and stamped by the Health Office staff before use. This work involved the checking of 167 hawkers.

Three hundred and twelve samples of milk were taken for chemical analysis. Out of these 127 were from town dairies, and 185 from the milk vendors from the rural districts. In addition, 15,611 lactometer tests were carried out at the Milk depôt, where milk brought from the rural areas is presented for inspection and sealing of milk cans before sale.

The following is the list of some of the foodstuffs found unfit for human consumption and condemned:—

Fresh fruits	500	lb.
Meat	66¼	,,
Fish	612	,,
Vegetables	4,350	,,
Rice	7,534	,,
Onions	18,985	,,
Beans	18,220	,,
Potatoes	6,640	,,

RURAL SANITATION: ZANZIBAR ISLAND

39. Three trained Sanitary Inspectors were on duty during the year in the following Districts:—

Makunduchi Rural District.
Chwaka Rural District.
Mkokotoni Rural District.

They regularly visited the villages in their areas and instituted various schemes for the improvement of sanitation and public health.

Mosquito Control

During the inspections a careful search was made for mosquito breeding places with the following results:—

	Anopheles	*Culex*	*Aedes*
Makunduchi ...	9	22	16
Chwaka	–	10	–
Mkokotoni	–	24	34

Collections of water and cesspits were oiled, and paris green sprayed on pools. Empty tins, coconut shells, etc., containing water were destroyed. Mosquito larvæ-eating fish (Sp. *Gambusia*) were maintained in large tanks, wells, etc.

Control stations for the collection of adult mosquitoes were arranged in various villages and monthly records of catches prepared.

Water-Supply

All wells and tanks were kept under close supervision. Arrangements were made for the clearance of thick vegetation from the surroundings and inside the wells, cleanliness of water receptacles, repair of broken parapet walls. In one instance two dead fowls had decomposed in a well, and the villagers were stopped from drawing water until the well had been thoroughly cleaned. The practice of washing clothes on the parapet walls of the wells was stopped, which prevented the serious pollution of water-supply.

Milk Supply

Milk collected in the areas for despatch to Zanzibar town was regularly tested by lactometer and milk that had obviously been adulterated or contaminated was rejected and destroyed.

Dead Animals

Three dead cows, one dead sheep, one dead dog and one dead fowl were found decomposing in various areas, and arrangements made for their sanitary disposal.

Infectious Diseases

All notified cases were investigated, and detailed reports made. In cases of tuberculosis and leprosy arrangements were made to send the patients and contacts to the Zanzibar hospital for examination and necessary treatment.

Vaccination against small-pox was carried out in some of the rural schools.

Owing to serious infestation of school children by jigger fleas in the Makunduchi District arrangements were made for the scholars to dip their feet in Izal disinfectant before entering the classes, and these resulted in the marked decrease of jigger sores.

Swamps

The various swamps were kept under constant observation for mosquito breeding and the snail hosts of bilharzia. One swamp was found with extensive anopheline mosquito breeding on the edges, which necessitated control measures.

Some swamps were treated with copper sulphate in order to eliminate the snails found breeding in them.

Endeavours were made to stop the local villagers from bathing in the snail-infested swamps.

Housing

During visits the opportunity was taken to advise the villagers on the construction of sanitary dwellings, and in Chwaka where development on the planned lay-out is taking place the building applications were referred to the Sanitary Inspector for his comments and supervision during erection.

Eating-houses, Markets and Food Stores

These premises were regularly inspected, and good progress made regarding the cleansing of utensils and floors, protection of food from contamination by flies, dust, etc.

Refuse Disposal

In Chwaka and Mkokotoni villages the refuse is collected by local sweepers, and taken to refuse dumps or compost beds.

The refuse from the remaining smaller villages is disposed of by crude tipping into pits and on the seashore. Gradually the villagers are being induced to collect the refuse in heaps to be destroyed by burning where no controlled dumping or compost beds can be properly arranged and supervised.

Fly Control

The standard wooden and wire-gauze fly-traps were distributed in all areas and arrangements made for the baiting and cleansing of them. All fly breeding places found were satisfactorily dealt with.

Rat Reduction

Rat-traps were issued to the villages when required and they reported the catches when returning the traps.

The number of rats caught during the year was as follows:—

Makunduchi District	346
Chwaka District	53
Mkokotoni District	366
Total ...	765

Health Education

During their visits the Sanitary Inspectors gave lectures to the villagers on such subjects as latrine construction, refuse disposal, lighting and ventilation, infectious diseases and their prevention, the value of bush clearance and the cleanliness of villages and huts.

PEMBA

PUBLIC HEALTH IN PEMBA

40. This work was under the direct control of the District Medical Officer.

Anti-Malarial Measures

During the year 1,500 feet of concrete drains were laid, 593,323 yards of bush cleared and 1,471 trees were planted.

Mosquito Control

The following numbers of mosquitoes were caught in control stations:—

Anopheles	*Aedes*	*Culex*
375	1,067	4,216

Sewage Disposal and Drainage

Forty-five new water closets were installed and 1,169 feet of earthenware pipe drains were laid. Twenty-eight septic tanks were installed and forty-two septic tanks or latrines were emptied.

Scavenging

Twenty-two thousand, nine hundred and seventy-three cartloads of refuse were removed.

Infectious Diseases

There were sporadic cases of mumps in Wete area. An outbreak of varicella in Wete Prison spread to the schools in Wete.

Immunisation against Yellow Fever

During the year 1,535 people were inoculated against Yellow Fever.

Immunisation against Typhoid

Forty-eight persons were inoculated with T.A.B. vaccine.

Immunisation against Cholera

One hundred and thirty-nine people were inoculated against cholera

Inspection of foodstuffs

The following were condemned:—

Beans	90 lb.
Wheat flour	50 lb.
Rice	19 ,,
Onions	1,050 ,,
Fish	1,360 ,,
Meat	81 ,,
Vegetables and fruit	275 ,,
Milk	84 gallons.

Housing

The following is a summary of the work done:—

Total number of building applications	703
To build huts	420
To build stone buildings	24
To repair huts	215
To repair stone buildings	13
Demolitions	31

SECTION IV.—PORT AND AERODROME HEALTH WORK

42. The Medical Officer of Health has continued to be responsible for these services and detailed figures are given later. A tribute must be paid to the sterling work of Health Inspectors concerned in this work. Their courtesy and punctuality have been admirable and there have been no untoward incidents.

The following is the record of those sections during the year 1952:—

Port

Ships which called	555
Dhows which called	1,503
Persons who arrived by sea	27,718
Persons who left by sea	23,995

Aerodrome

Aircraft which landed...	2,003
Persons who arrived by air	11,465
Persons who left by air	12,112

During the course of the careful checking of all health documents, the following passengers were found to have arrived either without the necessary vaccination and yellow fever certificates, or their certificates had expired or were otherwise invalid.

Ships' passengers	550
Air passengers	228

QUARANTINE STATION

43. Further repairs of buildings on the island were carried out and the furniture of the bungalows renovated.

The routine clearing of bush, filling of depressions, levelling of roads, etc., were performed.

During the year no person was placed in quarantine.

IMMUNISATION AGAINST YELLOW FEVER, ETC.

44. During the year 24,160 people were immunised against Yellow Fever. Yellow Fever certificates issued were in accordance with the International Sanitary Convention.

Also 636 persons were immunised against Cholera and 376 persons against Typhoid before proceeding overseas.

SECTION V.—MATERNITY AND CHILD WELFARE

MATERNITY AND CHILD WELFARE

	1948		1949		1950		1951		1952	
	New cases	Re-attendances	New cases	Re-attendances	New cases	Re-attendances	New cases	Re-attendances	New cases	Re-attendances
General cases ...	12,644	38,646	11,712	36,769	11,733	31,527	13,591	41,865	14,044	50,365
Ante-natal ...	396	1,338	423	1,151	441	1,368	428	1,201	529	1,307
Infant Welfare ...	364	1,036	362	790	393	448	156	1,173	273	1,347
Total ...	13,404	41,020	12,497	38,710	12,567	33,343	14,175	44,239	14,846	53,019
Zanzibar Rural Clinics:										
Mkokotoni ...	1,480	5,330	1,327	4,079	1,215	3,856	1,389	2,768	1,639	2,868
Mwera ...	855	2,658	742	2,410	269	627	227	654	355	966
Selem ...	504	1,617	236	693	302	326	406	772	200	787
Total ...	2,839	9,605	2,305	7,182	1,786	4,809	2,022	4,194	2,194	4,621
Zanzibar Maternity Hospital:										
Total confinements...	344		353		399		374		431	
Makunduchi Maternity Home:										
Total confinements	...		...		61		89		133	
Ante-natal ...	...	...	...	...	106	245	204	673	233	621
Infant Welfare ...	...	...	...	...	201	...	521	...	463	...
Total	...	...	...	...	307	245	725	673	696	621

Pemba—Wete Clinic:

Ante-natal cases ...	136	554	131	509	154	448	225	583	233	681
Infant Welfare ...	151	313	65	160	77	304	154	239	184	307
Total ...	287	867	196	669	231	752	379	822	417	988

Pemba—Chake Chake Clinic:

Out-patients ...	3,565	7,317	4,116	8,639	3.750	8,659	4,520	6.286	4,527	6.748
Ante-natal cases ...	68	223	70	256	140	315	111	290	132	239
Infant Welfare ...	224	1,049	139	651	248	766	570	878	260	780
Total ...	3,857	8,589	4.325	9.546	4,138	9,740	5,201	7,454	4,919	7.767

Wete Maternity Hospital:

Total confinements...	109		95		88		147		217	

Chake Chake Hospital:

Total confinements...	55		42		56		43		73	

ANALYSIS OF MATERNITY CASES

Maternity Hospital, Zanzibar

Total confinements	431
Maternal deaths	2
Infant deaths	7
Still born	15
Premature deaths	15
Caesarian section	2
Forceps deliveries	25

Maternity Hospital, Makunduchi

Total confinements	133
Primipara	28
Multipara	105
Multiple pregnancy	–
Retained placenta	1
Complicated cases transferred to Zanzibar Hospital	6

Wete

Total confinements	217
Primipara	62
Multipara	155
Normal deliveries	198
Forceps deliveries	9
Caesarian section	–
Abnormal presentations	10
Eclampsia	2
Infant deaths	8
Still births	17
Multiple pregnancy	7
Retained placenta	–
Craniotomies	–
Premature births	–

Chake Chake

Total confinements	73
Primipara	29
Multipara	44
Normal deliveries	52
Forceps deliveries	5
Abnormal presentations	8
Eclampsia	–
Craniotomies	3
Maternal deaths	–
Infant deaths	3
Still births	8
Multiple pregnancy	2
Retained placenta	–
Premature births	–

SECTION VI.—REPORT ON SPECIAL DEPARTMENTS

EYE CLINIC

45. The Pathologist was in charge of the Eye Clinic during the year. The following are the figures for cases treated:—

New cases	3,444
Re-attendances	13,988
Vision testing (candidates for Government employment and school boys for scholarships)	575
	18,007

Refraction for glasses	174
Operations major	74
Operations minor	13
Cases admitted to hospital	110

SURGERY

(Report of the Specialist Officer (Surgeon))

46. The Surgeon reports that although his daily routine surgery appears to consist of an endless succession of herniotomies and radical cures of hydrocœles yet on analysis it becomes evident that there is considerable variety in the surgical work done and that most of the common surgical conditions occur from time to time.

The following operations were performed at the Zanzibar Hospital during the year:—

Major Operations

Abdominal operations

1. Herniotomy	208
2. Strangulated Hernias	73
3. Appendicectomy	7
4. Perforated Peptic Ulcers	4
5. Volvulus	3
6. Gastro-enterostomy	1
7. Cholecystectomy	2
8. Colostomy	3
9. Laparotomies (various reasons)	25

Genito-Uninary

1. Hydroceles. Rad. Excision	112
2. Urethrotomies	3
3. Amputation of Scrotum	14
4. Orchidectomy	6
5. Supra-pubic drainage bladder	20
6. Supra-pubic prostectomy	7
7. Supra-pubic lithotomy	4
8. Other G.U.	4

Gynaecological

1. Hysterectomy	33
2. Ovariotomy	2
3. Other abdominal operations	7
4. Dilatation and Curettage	22
5. Retained Placenta	9
6. Caesarian Section	6
7. Perineal operation	5

Ear, Nose and Throat

1. Harelip	2
2. Tonsillectomy	11
3. Mastoid	1
4. Other	1

Eye Operations	59

Rectal operations

1. Haemorrhoidectomy	9
2. Fissures	1
3. Fistulae	3
4. Other	2

Fracture Operative	
1. Skull	2
2. Arms	5
3. Legs	4
Amputations	
1. Arms	3
2. Legs	5
Injuries various	6
Mastectomy	3
Phrenic Avulsion	24
Miscellaneous	33
	754

Minor Procedures

1. Incision of Abscesses	188
2. Injuries of soft tissues	11
3. Fractures	84
4. Genito-Urinary (sounds catheters, etc.)	235
5. Miscellaneous	175
	693

Out-Patient Theatre	
1. Incision of Abscesses	338
2. Tapping of Hydroceles	138
3. Soft tissue injury repairs	173
4. Unclassified	18
	667

LABORATORY, ZANZIBAR

47. The total number of examinations performed in Zanzibar was 28,816 and in Pemba 10,117.

The Laboratory work is summarised briefly as follows:—

Parasitological examinations	14,468
Bacteriological examinations	6,556
Serological examinations	1,817
Histological examinations	20
Medico-legal examinations	17
Post-mortem examinations	33
General (blood, biochemical, etc)	5,881
Special (Aschein-Zondek, veterinary, etc.)	24
	28,816

Malaria

The number of positive blood-films continue to show a decline over those of 1950 and 1951. The comparative figures are—

	1950	1951	1952
P. Falciparum	1,569	1,580	891
P. Vivax	262	188	154
P. Malariae	9	8	5
Undefined plasmodiae	217	75	135
	2,057	1,851	1,185

The demand from the hospital for crude liver extract and sterile saline, etc., continued to increase. The figures in litres supplied are as follows:—

	1950	1951	1952
Crude liver extract	162	173	175
5 Per cent Dextrose solution	133	106	202
Normal Saline	88	182	263
5 Per cent Dextrose in saline	64	37	–

In addition a considerable amount of sterilisation of dressing drums was performed for the hospital when the sterilizer went out of action.

Sterilised solutions were also prepared for the use use of the Eye Clinic and dilutions of old Tuberculin "T" for T.B. Clinic continued as previous years.

PEMBA

	Wete	*Chake*	*Mkoani*
Parasitological examinations ...	5,619	10,660	20
Bacteriological examinations ...	799	141	–
Serological examinations ...	729	185	–
Medico-legal examinations ...	2	–	–
General (blood, biochemical, etc.)	2,968	–	–
Total ...	10,117	10,986	20

REPORT OF DENTAL SURGEON

48. Visits to Pemba amounted to 86 days and the school dental services were continued throughout the year.

A new Austin van was purchased during the year to replace the old van.

The following is a summary of the main work carried out by the Department during the year. It does not include patients treated while in hospital for fractured jaws, etc.

	Attendances	*Extractions*	*Fillings*	*Scalings*
Schools	1,794	425	2,283	3
Native out-patient clinic	8,614	9,833	–	–
Other patients (officials and families and non-officials)	2,172	551	729	195

MENTAL HOSPITAL

49. No new building was undertaken at the Mental Hospital during the year. There is still urgent need for extra accommodation for male and female patients.

Very little planting was done owing to the failure of the rains.

Staff

There was no increase in the number of staff in 1952. The increase in the number of patients requires a corresponding increase in the number of staff, especially trained nursing staff.

The following figures show the number of patients treated:—

Remaining on 31st December, 1951	131
Admitted	69
Discharged	33
Deaths	12
Remaining on 31st December, 1952	149

WALEZO INSTITUTE

50. This institute, which is under the control of the Sisters of the Roman Catholic Mission, has accommodation for, (*a*) the old and infirm, (*b*) Tuberculosis patients, (*c*) Leprosy patients.

The following figures show the work done during 1952:—

Poor House

Number remaining 31st December, 1951 ...	151
,, admitted during 1952	118
,, discharged during 1952	54
,, died during 1952	68
,, remaining on 31st December, 1952 ...	147

Leper Settlement

Number remaining 31st December, 1951 ...	55
,, admitted during 1952	18
,, discharged during 1952	8
,, died during 1952	5
,, remaining 31st December, 1952 ...	60

Tuberculosis Ward

Number remaining 31st December, 1951 ...	6
,, admitted during 1952	32
,, discharged during 1952	10
,, died during 1952	22
,, remaining 31st December, 1952 ...	6

PRISONS

51. *Zanzibar.*—There were 983 new cases and 6,334 attendances at the Prison Infirmary and fifteen prisoners were admitted to hospital. Thirty-five cases of malaria and forty-four cases of venereal diseases were treated. One hundred and sixty-six cases of schostosomiasis and thirty-five cases of ankylostomiasis were recorded.

The following is a summary of the work carried out:—

	Number of persons admitted	*Daily average on sick list*
Zanzibar ...	983 ...	17
Pemba ...	118 ...	10.4

Rural Dispensary attendants at Kizimbani and Selem are in charge of Kinu-cha-Moshi, Langoni and Kichwele Prison Camps respectively. These are visited by the Medical Officer in charge, Prisons, once weekly.

SECTION VII.—FINANCE

(*a*) *Expenditure, Health Department*

	£
Personal Emoluments	65,797
Other Charges:	
General Stores	3,402
Drugs, Medical Stores and Equipment	22,363
Maintenance of Patients	18,306
Sanitation Labour	3,677
Miscellaneous Services	14,852
Total	128,397

(*b*) *Expenditure, Municipality*

	£
Personal Emoluments	3,932
Other Charges:	
Equipment and Stores	199
Sanitation Labour	11,721
Total ...	15,852

(*c*) *Revenue*

	£
Hospital Fees and Sale of Drugs	5,227
Dental Fees	392
Contribution from dependencies towards Quarantine Station	1,462
Total ...	7,081

SECTION VIII.—LEGISLATION AFFECTING THE PUBLIC HEALTH ENACTED DURING THE YEAR

General Notice No. 19.—The Births and Deaths Registration (Amendment) Decree, 1952.

General Notice No. 33.—Establishment of Quarantine Station at Wete.

General Notice No. 45.—The Mental Patients (Amendment) Decree, 1950: Date of the commencement of the Decree.

General Notice No. 70.—Public Health (Amendment Rules), 1952.

General Notice No. 81.—Public Officers (Change of Titles) Decree, 1937 (Variation of the First Schedule): Substitution of the Title of Director of Medical Services for the title of Senior Medical Officer.

General Notice No. 11.—Dangerous Drugs Decree (Dangerous Drugs Order), 1952.

Appendix I

RETURN OF DISEASES AND DEATHS

List No.	Diseases	Remaining in Hospital Dec. 1951	In-patients	Deaths	Out-patients	Remaining in Hospita Dec. 195
	General Infectious and Parasitic Diseases					
A 1	Respiratory Tuberculosis	9	172	31	283	27
A 2	Tuberculosis of Meninges and Central Nervous System	–	2	–		–
A 3	Tuberculosis of Intestines, Peritoneum and Mesenteric Glands	–	1	1	15*	–
A 4	Tuberculosis of bones and joints	–	2	–		–
A 5	Tuberculosis—all other forms	1	4	1		–
A 6	Congenital Syphilis	–	–	–		–
A 7	Primary Syphilis	–	17	–		–
A 7	Secondary Syphilis	–	24	–		–
A 8	Tabes Dorsalis	–	1	1	482†	–
A 9	General Paralysis of Insane	–	–	–		–
A 10	Cardio Vascular Syphilis	–	2	1		–
A 10	All other Syphilis	2	5	–		–
A 11	Gonorrhoea, Genito-Urinary	1	106	–		–
A 11	Gonococal infection of eye	–	4	–	826‡	–
A 11	Other Gonococcal infections	1	31	–		–
A 12	Typhoid Fever	1	7	–	–	–
A 13	Salmonella Infections	–	–	–	–	–
A 14	Cholera	–	–	–	–	–
A 15	Brucellosis	–	–	–	–	–
A 16	Bacillary Dysentery	1	22	1	54	–
A 16	Amoebiasis	1	43	1	41	1
A 16	Other Unspecified Dysentery	–	38	3	–	2
A 17	Scarlet Fever	–	2	–	–	–
A 18	Streptococal Sore Throat	–	8	–	–	–
A 19	Erysipelas	–	1	–	–	–
A 20	Septicaemia and Pyaemia	–	–	–		–
A 21	Diphtheria	–	3	2	1	–
A 22	Whooping Cough	1	6	2	141	–
A 23	Meningococcal Infections	1	2	1	–	–
A 24	Plague	–	–	–	–	–
A 25	Leprosy	–	2	1	30	1
A 26	Tetanus	–	8	8	6	–
A 27	Anthrax	–	–	–	–	–
A 28	Acute Poliomyelitis	1	1	1	1	–
A 29	Acute infectious Encephalitis	–	2	1	–	–
A 30	Late Effects Poliomyelitis and Infectious Encephalitis	–	1	–	–	–
A 31	Variola major	–	1	–	–	–
–A 31	Variola minor	–	~~3~~ –	–	–	–
A 32	Measles	–	4	–	44	1
A 33	Yellow Fever	–	–	–	–	–
A 34	Infectious Hepatitis	–	31	7	185	1
A 35	Rabies	–	–	–	–	–
A 36	Louse-borne Epidemic Typhus	–	–	–	–	–
A 36	Flea-borne Endemic Typhus	–	–	–	–	–
A 36	Tick-borne Typhus	–	–	–	–	–
A 36	Other Rickettisial Diseases	–	–	–	–	–
A 37	B.T. Malaria	1	26	2	698	–
A 37	Qt. Malaria	–	21	–	38	–
A 37	S.T. Malaria	8	257	8	2,802	–
A 37	Black-water Fever	–	2	1	1	–
A 37	Other Forms of Malaria	14	195	14	631	3
	Carried forward	43	1,057	88	6 279	36

*Other Tuberculosis. †Syphilis. ‡Gonorrhoea.

List No.	Diseases	Remaining in Hospital Dec. 1951	In-patients	Deaths	Out-patients	Remaining in Hospital Dec. 1952
	Brought forward ...	43	1,057	88	6,279	36
A 38	Schistosomiasis (haematobium) ...	–	25	1	639	–
A 38	Schistosomiasis (mansoni)	–	–	–	156	–
A 38	Schistosomiasis (Japonicum)	–	–	–	–	–
A 38	Other Unspecified Schistosomiasis ...	–	3	–	–	–
A 39	Hydatid Diseases	–	–	–	–	–
A 40	Onchocerciasis	–	–	–	–	–
A 40	Loiasis	–	–	–	–	–
A 40	Filariasis (bancrofti)	–	48	–	–	1
A 40	Other Filariasis	–	4	–	–	–
A 41	Ankylostomiasis	2	63	2	3,841	1
A 42	Tapeworm and other cestode infestation	–	1	–	5	–
A 42	Ascariasis	–	7	2	101	–
A 42	Guineaworm	–	–	–	–	–
A 42	Other diseases due to Helminths ...	–	–	–	–	–
A 43	Lymphogranuloma Venereum	–	11	–	–	–
A 43	Granuloma Inguinale	–	5	–	–	–
A 43	Other Unspecified Venereal Diseases ...	–	11	–	82	–
A 43	Food Poisoning, infective and toxic (excepting Salmonella infections) ...	–	2	2	–	–
A 43	Relapsing Fever	–	–	–	–	–
A 43	Weil's Deseases	–	–	–	–	–
A 43	Yaws	2	59	–	4,477	2
A 43	Chickenpox	–	~~60~~ 63	–	117	9
A 43	Dengue	–	–	–	–	–
A 43	Trachoma	–	4	–	7	–
A 43	Sandfly Fever	–	–	–	–	–
A 43	Leishmaniasis	–	–	–	–	–
A 43	Trypanosomiasis (gambiense)	–	–	–	–	–
A 43	Trypanosomiasis (rhodesiense)	–	–	–	–	–
A 43	Other Unspecified Trypanosomiasis ...	–	–	–	–	–
A 43	Dermatophytosis (Tinea)	–	1	–	162	–
A 43	Scabies	–	11	–	1,334	1
A 43	Other infectious and protozoal diseases	2	10	–	786	–
A 43	Other Parasitic Diseases	2	35	–	612	–
	New Growths					
A 44	Malignant Neoplasm Mouth and Pharynx	–	1	–		–
A 45	Malignant Neoplasm of Oesophagus ...	–	–	–		–
A 46	Malignant Neoplasm of Stomach ...	–	1	1		–
A 47	Malignant Neoplasm of Intestine ...	–	3	1		–
A 48	Malignant Neoplasm of Rectum ...	–	1	–		–
A 49	Malignant Neoplasm of Larynx ...	–	–	–		–
A 50	Malignant Neoplasm of trachea, bronchus and lung not specified as secondary	–	–	–		–
A 51	Malignant Neoplasm of breast	–	6	–		–
A 52	Malignant Neoplasm of cervix uteri ...	–	4	1		–
A 53	Malignant Neoplasm of other unspecified parts of uterus	–	4	–	31*	–
A 54	Malignant Neoplasm of prostate ...	–	9	4		–
A 55	Malignant Neoplasm of skin	–	–	–		–
A 56	Malignant Neoplasm of bone and connected tissue	–	5	–		–
A 57	Malignant Neoplasm of all other and unspecified sites	1	11	5		1
A 58	Leukaemia and Aleukaemia	–	–	–		–
A 59	Lymphosarcoma and other neoplasm of lymphatic and haematopoietic systems	–	3	–		–
	Carried forward ...	52	1,465	107	18,629	51

*Malignant Neoplasm.

List No.	Diseases	Remaining in Hospital Dec. 1951	In-patients	Deaths	Out-patients	Remainin in Hospita Dec. 195
	Brought forward ...	52	1,465	107	18,629	51
A 60	Benign Neoplasms and unspecified neoplasms	2	48	3	209	–
	Allergic, Metabolic and Blood Disease					
A 61	Nontoxic goitre	–	–	–	–	–
A 62	Thyrotoxioasis	–	–	–	–	–
A 63	Diabetes Mellitus	2	33	8	–	–
A 64	Beriberi	–	2	–	–	–
A 64	Pellagra	–	1	–	–	–
A 64	Scurvy	–	1	–	–	–
A 64	Kwashiorker	–	1	1	–	–
A 64	Other Deficiency States	3	19	3	–	–
A 65	Pernicious and other hyperchromic anaemia	–	4	1	–	–
A 65	Iron deficiency anaemias	–	71	22	–	10
A 65	Other anaemias	–	30	2	2,487	1
A 66	Asthma	–	22	–	260	1
A 66	Other allergic endocrine, metabolic and blood diseases	2	17	1	999	–
	Diseases of Nervous System and Sense Organs					
A 67	Psychoses	131	69	12	–	149
A 68	Psychoneuroses and disorders of Personality	–	1	–	11	–
A 69	Mental deficiency	–	2	–	–	–
A 70	Vascular lesions affecting central nervous system	–	11	3	–	1
A 71	Meningitis (except meningococcal and tuberculous)	–	3	1	–	–
A 72	Multiple sclerosis	–	1	–	–	–
A 73	Epilepsy	–	2	–	3	–
A 74	Inflammatory diseases of eye	–	32	–	824	1
A 75	Cataract	–	23	–	–	6
A 76	Glaucoma	–	3*	–	–	–
A 77	Otitis externa	–	7	–	1,755*	1
A 77	Otitis media and mastoiditis	–	14	–		1
A 77	Other inflammatory diseases of ear ...	–	3	–		–
A 78	All other diseases of nervous system, sense organs and auditory system ...	4	30	2	1,290	–
A 78	All other diseases and conditions of eye	5	33	–	84	1
	Circulatory Diseases					
A 79	Rheumatic Fever	–	2	–	–	–
A 80	Chronic rhuematic heart disease ...	–	5	2	–	–
A 81	Arteriosclerotic and degnerative heart disease	–	12	6	75†	–
A 82	Other diseases of heart	3	27	15		9
A 83	Hypertension with heart disease ...	–	5	1		–
A 84	Hypertension without mention of heart	–	4	1	761‡	–
A 85	Diseases of artieries	–	4	–		–
A 86	Other diseases of circulatory system ...	–	19	2		–
	Respiratory Diseases					
A 87	Acute upper respiratory infections ...	–	17	–	–	1
A 88	Influenza	–	13	–	–	–
A 89	Lobar pneumonia	17	262	23	281 §	9
A 90	Bronchopneumonia	3	56	14		–
	Carried forward ...	224	2,374	232	27,668	242

*Diseases of Ear and Mastoid Process. †Diseases of the Heart. ‡Other Circulatory Diseases. §Pneumonia.

List No.	Diseases	Remaining in Hospital Dec. 1951	In-patients	Deaths	Out-patients	Remaining in Hospital Dec. 1952
	Brought forward ...	224	2,374	232	27,668	242
A 91	Primary atypical, other and unspecified pneumonia	1	3	–	–	–
A 92	Acute bronchitis	–	66	–	–	–
A 93	Bronchitis, chronic and unqualified ...	2	8	–	–	–
A 94	Hypertrophy of tonsils and adenoids ...	–	16	–	–	1
A 95	Empyema and abscess of lung	–	7	1	–	–
A 96	Pleurisy	–	16	–	–	–
A 97	Pneumoconiosis	–	–	–	–	–
A 97	All other respiratory diseases	4	77	4	10,556	3
	Alimentary Diseases					
A 98	Dental Caries	–	8	–	5,825	–
A 98	All other diseases of teeth and supporting structures	–	48	–	–	2
A 99	Ulcer of stomach	–	12	–	–	1
A 100	Ulcer of duodenum	–	2	1	–	–
A 101	Gastritis and duodenitis	–	11	–	–	–
A 102	Appendicitis	–	14	3	–	–
A 103	Intestinal obstruction and hernia ...	11	439	29	667	10
A 104	Gastro-enteritis and colitis between 4 weeks and 2 years	–	6	–	154	–
A 104	Gastro-enteritis and colitis, ages 2 years and over	2	41	1	816	1
A 104	Chronic enteritis and ulcerative colitis	–	1	–	–	–
A 105	Cirrhosis of liver	–	16	3	–	1
A 106	Cholelithiasis and Cholecystitis ...	–	7	–	–	–
A 107	Other diseases of digestive system ...	2	116	3	7,544	7
	Genito-Urinary Diseases					
A 108	Acute nephritis	–	5	1	–	–
A 109	Chronic, other and unspecified nephritis	–	12	5	–	2
A 110	Infections of Kidney	–	1	–	–	–
A 111	Calculi of urinary system	–	9	–	–	–
A 112	Hyperplasia of prostate	–	8	1	–	–
A 113	Diseases of breast	–	12	–	–	–
A 114	Hydrocele	–	139	–	603	4
A 114	Disorder of Menstruation	–	6	–	–	–
A 114	Other diseases of genito-urinary system and male genital organs	12	136	2	1,715	10
A 114	Other diseases of uterus and female genital organs	–	96	–	1,372	4
	Diseases of Pregnancy Puerperium					
	Normal Pregnancy	–	–	–	491	–
A 115	Sepsis of pregnancy, childbirth and the puerperium	–	–	–	–	–
A 116	Toxaemias of pregnancy and the puerperium	–	7	6	29	–
A 117	Haemorrhage of pregnancy and childbirth	–	–	–	–	–
A 118	Abortion without mention of sepsis or toxaemia	–	48	–	–	1
A 119	Abortion with sepsis	–	2	1	–	–
A 120	Delivery without complication ...	–	198	–	–	4
A 120	Other complications of pregnancy, childbirth and puerperium	3	62	5	204	–
	Carried forward ...	261	4,029	298	57,644	293

List No.	Diseases	Remaining in Hospital Dec. 1951	In-patients	Deaths	Out-patients	Remaining in Hospital Dec. 1952
	Brought forward ...	261	4,029	298	57,644	293
	Skin and Musculo-Skeletal Diseases					
A 121	Infections of skin and subcutaneous tissue	–	268	4	8,637	15
A 122	Arthritis and spondylitis	–	57	–	–	1
A 123	Muscular rheumatism and rheumatism unspecified	–	29	–	–	–
A 124	Osteomyelitis and periostitis	–	15	1	–	–
A 125	Ankylosis and acquired musculo-skeletal deformities	–	4	–	–	–
A 126	Chronic ulcer of skin	–	335	1	3,092	30
A 126	All other diseases of skin	30	132	3	1,838	2
A 126	All other diseases of musculo-skeletal system	–	119	5	–	14
A 127	Spina bifida and meningocele	–	–	–	–	–
A 128	Congenital malformations of circulatory system	–	–	–	–	–
A 129	Other congenital malformations ...	–	5	–	1,252	1
	Diseases of Newborn					
A 130	Birth injuries	–	1	1	–	–
A 131	Postnatal asphyxia and atelectasis ...	–	2	2	–	–
A 132	Diarrhoea of newborn (under 4 weeks)	–	–	–	–	–
A 132	Ophthalmia neonatorum	–	–	–	–	–
A 132	Other infections of newborn	–	1	–	–	–
A 133	Haemolytic disease of newborn ...	–	2	2	–	–
A 134	All other defined diseases of early infancy	–	17	17	–	–
A 135	Ill-defined diseases peculiar to early infancy, and immaturity unqualified	–	1	–	9	–
A 136	Senility without mention of Psychosis	1	27	17	–	3
A 137	Pyrexia of unknown origin	–	108	4	4,483	2
A 137	Observation, without need for further medical care	1	–	–	–	–
A 137	All other ill-defined causes of morbidity	14	263	4	2,569	16
	Injuries					
A 138	Fracture of skull	–	13	7	89*	–
A 139	Fracture of spine and trunk	–	16	5		3
A 140	Fracture of limbs	–	68	2		4
A 141	Dislocation without fracture	–	7	–		–
A 142	Sprains and strains of joints and adjacent muscle	–	49	–	214	–
A 143	Head injury (excluding fracture) ...	–	23	–	–	–
A 144	Internal injury of chest, abdomen, and pelvis	–	9	4	–	–
A 145	Laceration and open wounds	–	191	–	–	8
A 146	Superficial injury, contusion and crushing with intact skin surface	–	124	–	–	1
A 147	Effects of foreign body entering through orifice	–	4	–	166	–
A 148	Burns	–	44	3	289	3
A 149	Effects of poisons	–	4	2	7	–
A 150	All other and unspecified effects of external causes	20	261	2	5,814	–
	Total ...	327	6,228	382	86,103	396

*Fractures and dislocations.

Appendix II

REPORT OF THE T.B. UNIT

Part I

TUBERCULIN TESTING SURVEY

This survey started in 1951, was completed in 1952, and the results given in this report are the complete figures for both years.

Tuberculin Jelly was applied in the shape of a V to an area of skin between the shoulder blades prepared with ether, and rubbed gently with flour paper. The tests were read 72 hours later.

Out of a total population 268,000; 23,246 tests were done, and 20,224 of them read: Gathering this number of people together involved a great deal of work for the Mudirs and their Shehas. In some areas the people came forward with great reluctance, particularly in Pemba and in the island of Tumbatu. In three centres, only those too old or infirm to take to the bush were seen at all.

No amount of persuasion could induce the people to let their women be tested. In all 4,479 women were seen, most of them school girls, and when this number is split up into age groups, race, and district, the numbers apart from the age groups 5–19 are very small.

FIG. I

	Africans		*Arabs*		*Asians*	
	Male	*Female*	*Male*	*Female*	*Male*	*Female*
Zanzibar Town	2,369	1,125	718	348	1,768	1,206
Zanzibar District	4,027	388	315	–	–	–
Pemba Town	1,532	441	362	129	350	147
Pemba District	3,589	588	615	107	–	–
Total	11,517	2,542	2,010	584	2,118	1,353

Method

Different workers have made different claims for the accuracy of the method used in this survey. Most, however, are agreed that up to the age of 15 it corresponds closely to a Mantoux test using intradermal 1/1,000 Tuberculin. This is my own experience. Until the age of 15 Mantoux and jelly usually give results within 3 per cent of each other; but after that age the jelly gives results up to 20 per cent lower. In adults the jelly test gives results that lie almost mid-way between 1/1,000 and 1/10,000 Mantoux.

The advantages of jelly are the simplicity, so that trained staff may be entrusted with it, and the painlessness, so that it does not alienate the people.

The disadvantages are that it is less accurate than the Mantoux 1/1000; that it is not easy to compare the results with those of other surveys that have been done in East Africa; and that it gives little information about the degree of sensitivity.

Enough intradermal tests, however, have been done in Zanzibar town to make a fair comparison with published surveys in Tanganyika, Kenya and Uganda (*see* Figs. V and VI).

FIG. II

AFRICANS—TOWN

Age Group	*No. Tested*	*Males* +	*Percentage*	*No. Tested*	*Females* +	*Percentage*
–4	174	16	9	112	8	7
5–9	445	112	25	354	78	22
10–14	688	214	35	430	132	31
15–19	206	100	49	119	54	45
20–29	243	151	62	47	25	53
30–39	187	119	64	23	13	56
40–49	100	114	67	18	8	–
50–59	178	74	64	14	8	–
60+	142	79	56	8	6	–
	2,363			1,125	Total	=3,488

NORTH AND CENTRAL DISTRICT

0–4	74	4	6	59	4	–
5–9	312	40	13	9	3	–
10–14	301	85	28	–	–	–
15–19	97	38	39	–	–	–
20–29	450	225	50	–	–	–
30–39	522	291	56	–	–	–
40–49	412	260	63	–	–	–
50–59	282	176	62	–	–	–
60+	251	153	61	–	–	–
	2,701			68	Total =	2,769

AFRICANS—SOUTH DISTRICT

0–4	75	3	4	19	0	–
5–9	392	37	9	105	12	11
10–14	396	65	16	94	15	16
15–19	106	21	20	200	4	–
20–29	115	46	40	32	13	–
30–39	101	50	50	27	14	–
40–49	61	39	64	16	9	–
50–59	47	24	56	4	3	–
60+	31	18	58	35	1	–
	1,326			320	Total	=1,646

ZANZIBAR ISLAND TOTAL AFRICANS.

Male		*Female*		*Total*
6,396	+	1,513	=	7,909

PEMBA URBAN

Age Group	*No. Tested*	*Males* +	*Percentage*	*No. Tested*	*Females* +	*Percentag*
0–4	60	3	5	16	0	–
5–9	182	16	9	135	12	9
10–14	255	35	14	193	26	13
15–19	69	18	26	7	2	–
20–29	413	129	31	44	14	–
30–39	151	76	50	25	5	–
40–49	198	91	46	13	5	–
50–59	147	55	37	3	1	–
60+	57	16	28	5	0	–
					Total =	1,973

PEMBA ARABS—URBAN

		Males			*Females*	
Age Group	*No. Tested*	+	*Percentage*	*No. Tested*	+	*Percentage*
0–4	2	0	–	3	0	–
5–9	79	16	18	38	4	–
10–14	141	39	28	76	8	–
15–19	11	3	–	2	0	–
20–29	43	19	–	4	1	–
30–39	43	24	–	4	0	–
40–49	26	10	–	1	1	–
50–59	10	6	–	1	0	–
60+	7	1	–	–	–	–
	362			129	Total =	491

RURAL

		Males			*Females*	
Age Group	*No Tested*	+	*Percentagw*	*No. Tested*	+	*Percentage*
0–4	5	0	17	7	0	–
5–9	196	13	11	73	2	–
10–14	188	31	–	19	2	–
15–19	45	4	–	–	–	–
20–29	64	415	–	4	0	–
30–39	51	14	–	1	1	–
40–49	28	9	–	–	–	–
50–59	15	6	–	2	1	–
60+	23	3	–	1	0	–
	615			107	Total =	722

ZANZIBAR AND PEMBA TOTAL ARABS

Males		*Females*		*Total*
2,010	+	584	=	2,594

MUSLIM INDIANS—ZANZIBAR ISLAND

		Males			*Feamles*	
Age Group	*No Tested*	+	*Percentage*	*No. Tested*	+	*Percentage*
0–4	6	0	0	6	1	–
5–9	329	44	13	299	42	14
10–14	419	138	33	304	69	23
15–19	250	92	37	181	56	31
20–29	17	16	–	4	3	–
30–39	9	7	–	2	2	–
40–49	6	5	–	1	0	–
50–59	4	4	–	–	–	–
60+	2	2	–	–	–	–
	1,042			697	Total =	1,739

PEMBA ISLAND—ALL INDIANS

		Males			*Females*	
Age Group	*No. Tested*	+	*Percentage*	*No. Tested*	+	*Percentage*
0–4	14	1	–	8	1	–
5–9	92	6	–	59	6	–
10–14	72	15	–	57	6	–
15–19	21	5	–	4	1	–
20–29	34	9	–	9	2	–
30–39	41	12	–	6	1	–
40–49	38	12	–	2	1	–
50–59	22	5	–	–	–	–
60+	16	4	–	2	0	–
	350			147	Total =	497

Race

The cases have been divided up into African, Arab and Asian. Although the latter is a clear-cut distinction many Africans give their race as Arabs, and it is not always easy to decide which they are. Their word was not accepted if their appearance belied their claim.

Matthews in 1931 claimed that mainlanders in the rural districts, because they had all passed through the town, showed a higher positive reactor rate than Zanzibaris. This was not found to be so in the present survey. The dividing line between the two is not very clear, but those who gave their race as Shirazi, Swahili, Mhadimu, Mtumbatu or Mpemba were classed together as Zanzibaris, and the rest as mainlanders. The ratio Zanzibar : mainlanders increases with the distance from the town, from 1 : 5 in and around the town to 20 : 1 in the extreme north and south. The reactor rate varied with district, but where enough of both groups from the same area were tested, no significant difference was found between the two. For the sake of simplicity, therefore, Africans are not sub-divided.

Age

The difficulty of deciding an African's age is too well recognised to require comment. In every case I have read the results of the test myself, and have, where necessary, decided into what age group the case should be placed.

Until the age of 20, age groups of five have been used, and thereafter of ten, going up to 59. The last age group is 60 and over, and has been separated because of the fall in reactor rates, which occurs in older people, is more marked when the jelly test is used.

District

In Zanzibar island cases are shown under three topographical districts, Town, North and Central District, and Makunduchi Mudiria.

The North-Central District includes five Mudirias, Mkokotoni, Mangapwani, Koani, Chwaka and Magharib. The figures from these five centres are so alike, that, to avoid further sub-division, they are treated as one district.

Makunduchi, however, has been treated separately, it is forty miles from Zanzibar town, inhabited almost exclusively by Zanzibaris, and is a little more isolationist in outlook than the other districts.

Pemba has been divided into two groups Urban, which includes Wete and Chake Chake, and Rural, which includes the rest of the island (*see* Figures II and III at the end).

Comments

African Males.—The figures show that in the town about a quarter are positive by the age of 10, a half by the age of 20 and two-thirds by the age of 40. For women, as far as they go, the figures show a comparable, but slightly lower reactor rate.

In the North and Central district the figures are all lower, and in Makunduchi lower still; but by the age of 40 there is little difference between the three groups.

Although the reactor rate generally is rather low, nothing in the relationship between the three groups so far causes any surprise. It is to be expected that the reactor rate in the densely populated town would be highest: that in the more accessible districts having daily traffic with the town it would be slightly lower, and that the more remote and aloof Makunduchi would be lowest of all. Hayes in Kenya also found that in adult life the reactor rate in the districts approximated that of the towns. Children tend to remain in their own villages, as jaunts to the town are considered a costly and frivolous luxury, but many of the young men go to seek work, only returning home after months or years.

The greater fall among townsfolk in the over-60 age group as compared with the rural groups is not so easy to explain.

It would be expected that, living in the town, more opportunity of repeated infection would have kept the level of sensitivity higher, but instead those over 60 years of age in the town show 56 per cent positives, while the same age groups in two rural areas show 61 per cent and 68 per cent respectively.

Two possible explanations present themselves: the greater inaccuracy of the jelly test on dry, wrinkled old skins; and the possibility that in town the average age, in this group, may have been significantly greater than in the rural districts, i.e., there were more between 70–80 than between 60–70.

The fact that this is not due entirely to the method used is shown by Fig. V which represents the reactor rate in male Africans to 1/1000 Mantoux. Here the fall is even steeper, from 86 per cent in the 50–59 age group to 71 per cent in the over-60's.

Pemba is less densely populated than Zanzibar, less well-served by roads and cut off not only from the African mainland but from Zanzibar island by twenty miles of sea. Its two towns are small and not particularly crowded.

For these reasons a smaller proportion of its people would be expected to react to tuberculin.

A glance at Fig. III shows that the reactor rate is very low indeed. In the towns the figures are very close to those for Makunduchi up to the age group 30–39., but thereafter the fall is steep, reacting as low as 28 per cent for the over-60's.

In the rural areas the reactor rate is even lower, reaching its highest level in the 30–39 and 40–49 groups but even here it is only 27 per cent.

It is possible that the error of the jelly test is emphasised where the reactor rate is low, because where this occurs the degree of sensitivity is low also. Unfortunately fewer intradermal tests were done in Pemba, but of 102 Africans males in the towns from 20–49 who received the 1/1000 Mantoux only forty-six were positive.

Although further investigation is needed to elucidate this point, it must be accepted that the reactor rate in Pemba is considerably lower than in any district in Zanzibar, and also lower than anywhere else in East

Africa where a tuberculin testing survey has been carried out. The general state of health in Pemba is lower than in Zanzibar, as judged by general appearances. There is more malaria, bilharzia, yaws and malnutrition. The Wapemba can only be induced to grow food with the greatest difficulty, preferring to tend their clove trees which are a better source of cash than of calories. Enriched by a bumper crop of cloves, the Wapemba invested heavily in motor cars, which, after a few months they could not afford to run. Food is thus very expensive. This may partly explain the low sensitivity rate.

A review of the clinical material shows that cases of active disease among the Wapemba are all acute, mostly of the primary type, and seldom live very long, even when caught comparatively early and placed in hospital. There may not, therefore, be many chronic open cases walking about for a year or more, disseminating their bacilli among their neighbours.

Willcox considers that the reactor rate in a community is a fair index of the number of active cases of disease. From this Pemba might reasonably be expected to show a low morbidity. In this survey over seven active cases were found per 1,000 of the population, more than in the Makunduchi area, and only just less than in the other Zanzibar rural area.

The facts may perhaps be explained as follows: A hundred years ago, Zanzibar was the busiest and filthiest port in tropical Africa. Tuberculosis undoubtedly existed, and may have caused a large epidemic, which Pemba, in comparative isolation, escaped. Since then the clinical disease in Zanzibar with its good communications has become modified by three or four generations of selection.

In Pemba, where selection has not had time to play its part, where less than one-third of the adult population has been infected, and where general non-specific resistance is low, the disease is the typical acute primitive tuberculosis that is of such short duration that each case has little time to infect others.

If, as it seems, there are more open cases in Pemba than would be expected from the very low reactor rate, Pemba may well be the most important and urgent problem that we have to face.

Other Races.—The Arabs tested in the town show a slightly higher reactor rate than the Africans, and the few tested in the districts tend to show figures comparable with those in the town.

Asians of school-age in the town, surprisingly, show a lower rate than other races.

Fig. IV

	Asians (Males)			*Africans and Arabs (Males)*		
	Total	*Reactors*	*Percentage*	*Total*	*Reactors*	*Percentage*
5–9	522	68	13	638	166	26
10–14	782	242	31	972	345	37
15–19	420	152	36	276	137	50

At the first glance it is not obvious that the Asian children live in better houses, or in conditions which would discourage the dissemination of tubercle bacilli. They live, mostly, in the Stone town where the tall densely packed houses are separated by the narrowest possible streets so that fresh air and sunlight are effectively excluded.

The Asians, nevertheless, look after their children extremely well, almost to the point of obsession, and perhaps after all they are better off than the Africans in their smoky huts in Ngambo, they are certainly much wealthier.

Comparison with other East African Surveys

Willcox (1935), Haynes (1948) and Santon Gilmour (1950) have published the results of their surveys in Tanganyika, Kenya and Uganda respectively. Willcox and Haynes used intra-dermal O.T. 1/1000 and Gilmour intra-dermal O.T. 1/10000. So that comparison between their results and mine is not easy.

One thousand six hundred and sixteen male Africans were tested with graded Mantoux tests in Zanzibar town, and Fig. V compares these results with those from the mainland.

Fig. V

Age Group		*Zanzibar*	*Mombasa (Haynes)*		*Tanga (Willcox)*	
		Per cent	*Age Group*	*Percent*	*Age Group*	*Percent*
5– 9	88: 23	26	1	3.6	5	–
10–14	104: 38	37	1– 3	8.5	6–15	32
15–19	83: 48	58	4– 6	25	16–25	87
20–29	622:442	71	7–12	37	20–50	89
30–39	419:343	82	13–18	70	50+	82
40–49	228:190	83	19–25	83	—	–
50–59	93: 80	86	26–40	91.4	—	–
60+	79: 56	71	41+	96.3	—	–
	1,616.					

The comparison is made clearer by the histograms in Fig. VI at the end.

Zanzibar figures are close to those of Tanga and Mombasa for children, but are generally lower in adults. This difference is also apparent in comparing Matthew's figure for Zanzibar in 1931 with those from the mainland.

The reactor rate to 1/10000 O.T. are very close to Gilmour's figures from Uganda.

Three possible explanations for the lower reactor rate in Zanzibar as compared to Mombasa and Tanga are—

(1) Wealth and Arab influence have, until recently, given them a higher standard of living and better housing.

(2) The high rate of immigration from parts of Tanganyika where the reactor rate is low.

(3) The drift of local Africans in from Pemba and the remoter districts.

Summary of Findings

1. The jelly tests give results close to those of 1/1000 Mantoux up to the age of 15, but thereafter gives results 10 – 20 per cent lower.

2. Asian school children show a lower reactor rate than Africans and Arabs.

3. Women, on rather small figures, show a slightly lower reactor rate than men.

4. In the town, Africans show a comparable but lower rate than those in Tanga and Mombasa.

5. The rural population of Zanzibar island show a lower reactor rate in children and young adults, but by middle life it is very close to the town. In the younger age groups Makunduchi gives the lowest figures.

6. The reactor rate in Pemba is very low indeed.

Tuberculosis Morbidity

Without mass radiography it is not possible to give an accurate estimate of the prevalence of respiratory tuberculosis in a population.

In the course of the present survey everyone returning to have his test read was asked whether he had any chest symptoms, whether his test was negative or positive. If he had symptoms his chest was examined and a sample of sputum taken if this was available.

Most of these cases in Zanzibar island were persuaded to come into town where they were fluoroscoped, so that a definite diagnosis was made in a high proportion of cases.

Even in unselected groups of the population some selection will occur, some cases will purposely hide themselves if they have the disease, while others who know they have it will come forward, or be brought, to seek treament.

The figures are given in number of cases per 1,000 population, and mean active cases in need of treatment.

Cases are given under separate headings for children, and adults over the age of 15—

FIG. VII

ZANZIBAR TOWN

	No. Tested	*Reactors*	*No. Examined*	*No. of Cases*
AFRICANS MALES				
Children	1,307	369	369	3
Adults	1,062	637	57	13
AFRICANS FEMALES				
Children	896	218	218	1
Adults	229	114	9	1
ARABS MALES				
Children	480	159	159	1
Adults	238	145	145	3
ARABS FEMALES				
Children	295	80	80	1
Adults	53	23	23	1
TOTAL				
Children	2,978	–	6 = 2/1,000	
Adults	1,582	–	18 = 11.4/1,000	

DISTRICT N & C.

	No. Tested	*Reactors*	*No. Examined*	*No. of Cases*
AFRICANS MALES				
Children	687	129	129	1
Adults	2,014	1,143	96	16
ARABS MALES				
Children	171	50	50	1
Adults	144	121	12	2
TOTAL				
Children	858	179	179	2=2.4/10,000
Adults	2,158	1,264	108	18=8.2/1,000

MAKUNDUCHI

	No. Tested	Reactors	No. Examined	No. of Cases
African Males				
Children	863	105	105	1
Adults	835	–	81	4
African Females				
Children	218	27	27	–
Adults	145	–	12	–
Total				
Children	1,081	–	–	1
Adults	980	–	–	4 = 4.1/1,000

PEMBA—URBAN

	No. Tested	Reactors	No. Examined	No. of Cases
African Males				
Children	497	54	54	2
Adults	1,035	385	49	7
African Females				
Children	344	38	–	–
Adults	97	27	–	1
Arab Males				
Children	222	55	–	–
Adults	140	63	–	1
Arab Females				
Children	117	12	—	—
Adults	12	2	–	–
Total				
Children	1,180	–	–	2
Adults	1,284	–	–	9=7.2/1,000

RURAL

	No. Tested	Reactors	No. Examined	No. of Cases
Africans Males				
Children	1,425	87	–	1
Adults	2,164	–	–	15
African Females				
Children	398	–	–	–
Adults	190	–	–	3
Arab Males				
Children	389	–	–	–
Adults	226	–	–	2
Arab Females				
Children	99	4	–	–
Adults	8	2	–	–
Total				
Children	2,311	–	–	1
Adults	2,528	–	–	20=7.7/1,000

Part II

SUMMARY OF CLINICAL FINDINGS

Type of Disease

In the two years under review, out of 358 cases of tuberculosis, only fifteen cases of non-respiratory disease were seen. With two exceptions these were all Asians or Arabs. This remarkable preponderance of respiratory disease was observed in 1931 by Matthews—

Respiratory tuberculosis	...	269
Non-respiratory tuberculosis	...	6 (5 Asians and 1 Arab)

and was also reported by workers in other East African territories.

Type of Organism

The Veterinary department, who are about to carry out a more detailed investigation on this question, know that tuberculosis exists among cattle, but consider that it is rare. A small tuberculin testing survey shows only a 4 per cent reactor rate.

Types of Respiratory Disease

It is often not possible to tell with certainty whether a lesion is primary, post-primary or delayed. Many of the Asians, Arabs, and some of the Africans from the town, have lesions which resemble in appearance and behaviour the delayed, adult phthisis as it is seen in Europe. With the exception of those in Government service, or employed by the big firms, most Africans have only been seen when their disease has progressed so far that it is impossible to say how it started. Nearly all African cases from Pemba and Makunduchi, and many from Zanzibar conform with the classical picture of "primitive tuberculosis", in that they are acute, rapidly progressive and die quickly. The great majority of these cases occur between the age of 35–45 when, with the exception of Pemba, over 60 per cent of the population are tuberculin reactors.

Many contacts of open cases have been examined. They show a high rate and degree of sensitivity to tuberculin, but fluoroscopy has failed to demonstrate many cases of active disease or, except in Asians, evidence of past infection. Nor have many cases of primary complex been seen in Africans.

Professor Lyle-Cummins has shown that in the Rand mines tuberculin reactors are more likely to contract active disease than non-reactors; and Haynes believes that a primary infection may confer the allergy without the resistance that is believed to go with it in Europeans. The fact that these two states may occur separately has been demonstrated experimentally.

It is also noted that in the 15–19 age group 25 per cent of reactors to the Mantoux test 1/1000 react to 1/1000000.

It is possible that a moderate dose of tubercle bacilli may establish an unstable, symptomless lesion that is not radiologically demonstrable: that the larger dose necessary to establish a typical primary complex (that also confers partial immunity in Europeans), causes a progressive lesion in Africans: and that later in the former case, when resistance is lowered by leaving the familiar environment, by malnutrition or intercurrent disease, and unstable lesion breaks down and causes progressive disease. This breakdown may also be caused by an exogenous re-infection.

The factors that affect the prognosis in a particular case may be considered as follows: —

(1) *Special states.*—A high standard of living and sufficient intelligence to make a patient co-operative are all important.

(2) *Early diagnosis.*—Almost all cases of early disease do well on hospital treatment at first, but those patients with low natural resistance are unstable, and relapse very easily. Unfortunately these patients are often the hardest to keep in hospital.

(3) *Freedom from economic difficulties.*—For Government employees this is ensured at first by the payment of full salary for six months, and half-salary for a further six months.

The big commercial firms also make generous provision for their employees but this unfortunately applies to only a small proportion of the population.

(4) *Place of residence.*—The fact that, other things being equal, race alone does not account for differences in reaction to infection is suggested by the cases seen from Makunduchi. Two racial groups live in this area. Zanzibaris and the Kumbaros, who are low caste Muslim Indians who settled in the Makunduchi Mudiria about 100 years ago and work as drivers and shop-keepers. There are only a few hundred of them and those that were tuberculin-tested showed a high rate of positive reactors. In all, seven cases of active disease have been seen from this community; and all of them were acute progressive disease that did not react to treatment. Zanzibaris from Makunduchi, among whom there is a lower reactor rate than elsewhere in the island and from Pemba also, seem to suffer from the same type of disease.

(5) *Race.*—So complex is this factor in the heterogeneous population of Zanzibar that, on the number of cases seen so far, only a few definite conclusions can be stated—

(*a*) That Asians (with the exception of Kumbaros) have the highest degree of resistance.

(*b*) That Arabs have less than Asians, but more than Africans.

(*c*) That certain mainland tribes, notably the Mnyamwezi from Tanganyika, and the Kumbaro have least of all.

Even these conclusions are open to doubt. Arab patients have mostly come from the town, most of them from a better economic environment, and many from Government service, so that they were seen soon after the onset of symptoms.

The Wanyamwezi arrive in great numbers from Tanganyika to seek work, live in town until they find it, and then go out to work on the land where their living conditions are often very bad. They are thus uprooted from their familiar tribal environment, in which they may show as much resistance as other tribes, Matthews found in 1931 that there was a lower rate of disease among local Africans. This is true, probably because they are not uprooted from their own environment as the mainlanders are, and because most of them live far from the town where opportunities for close and prolonged contact with the disease are not so great.

Treatment

Prolonged bed rest with posture is the first essential in treatment, but except in the very early lesions, is not in itself enough. Even when this is combined with streptomycin and P.A.S. the excellent early results are followed by relapse in a high proportion of cases.

Some form of collapse therapy is therefore essential in most cases, and must be maintained for a period of years to prevent the lesions from breaking down.

Artificial pneumothorax is the most satisfactory for upper zone lesions, but under the conditions that obtain at present it presents great difficulties. Big adhesions prevent most of them from being satisfactory. They require more skill in management, frequent radiological control and prolonged co-operation on the part of the patient. Moreover an A.P. that goes wrong is often a very unpleasant thing.

For this reason phrenic paralysis and pneumo-peritoneum has become our great stand-by. It is less certain and predictable in its action, and is also affected unfavourably by special adhesions. But for the middle and lower zone lesions and bilateral disease it is more satisfactory, it is less often followed by complications, and it is much easier to control. It is not possible to do a properly controlled experiment on a small number of cases complicated by the many factors mentioned under prognosis, but the place of chemotherapy in treatment is becoming clearer.

Streptomycin and P.A.S. are not mainly used in two sets of circumstances—

(1) In the presence of complications.

(2) In cases where a high degree of toxæmia or extensive bilateral disease render a case unfit for collapse therapy.

Many cases can be made fit for collapse therapy in this way.

Thiocetazone by itself is disappointing. It is useful in tuberculosis, bronchitis and laryngitis, and is probably better than nothing in other cases, but its main use is as a substitute for P.A.S. which patients find unpleasant to take in the large doses necessary.

I.N.A.H. has only recently been introduced and in the few cases so far treated it has shown great promise. It seems slower than streptomycin in converting the sputum, but induces a sense of well being in the patient after quite a short time. This may well prove of doubtful advantage in Africans who tend to consider themselves cured long before they are fit to get out of bed.

From the point of view of keeping patients in hospital and ensuring their regular attendance at the chest clinic some treatment is better than none at all.

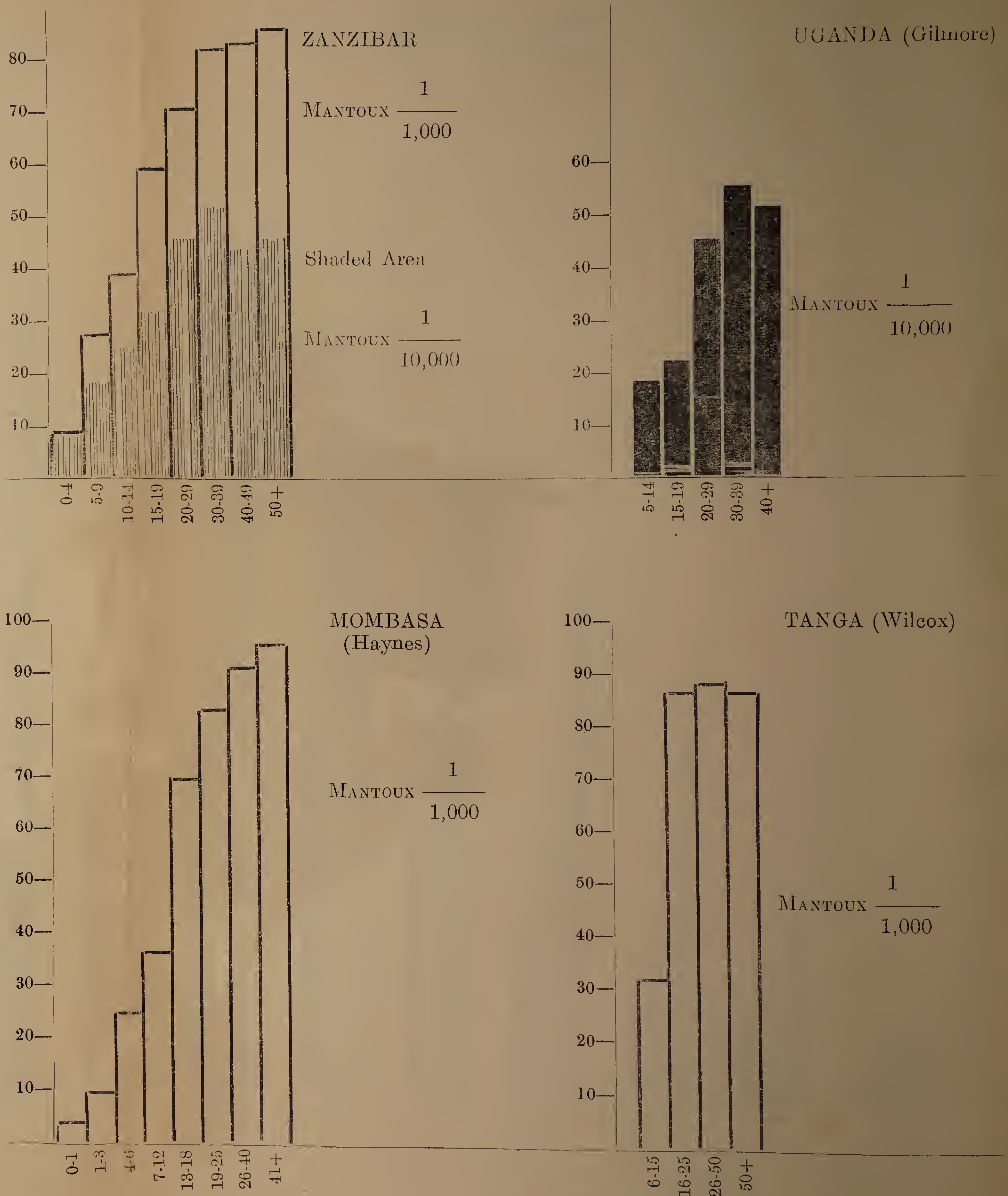
A.P.P. even if in theory ineffective, has this effect, and is worthwhile for that reason, but it is still of paramount importance to select cases for admission to Dole hospital with care.

The work of the last two years, which will form the subject of a full report, must be regarded as the preliminary research on which a comprehensive T.B. service can be built.

K. D. YOUNG,
Medical Officer-in-Charge, T.B. Unit

Zanzibar, 20th September, 1952

Fig. VI


ZANZIBAR
Mantoux 1/1,000
Shaded Area
Mantoux 1/10,000
10
20
30
40
50
60
70
80
0-4
5-9
10-14
15-19
20-29
30-39
40-49
50+
UGANDA (Gilmore)
Mantoux 1/10,000
10
20
30
40
50
60
5-14
15-19
20-29
30-39
40+
MOMBASA (Haynes)
Mantoux 1/1,000
10
20
30
40
50
60
70
80
90
100
0-1
1-3
4-6
7-12
13-18
19-25
26-40
41+
TANGA (Wilcox)
Mantoux 1/1,000
10
20
30
40
50
60
70
80
90
100
6-15
16-25
26-50
50+